Claims

We claim:

1. A method for electrophoretic separation of a mixture of oligonucleotide fragments, wherein said mixture contains at least two fragments of different lengths and said lengths are between 0 and 100 bases the steps of the method comprising;

a) filling at least one microchannel with a separation media, said separation media including non-entangled polyvinylpyrrolidone;

b) injecting the mixture of oligonucleotide fragments into a first end of said microchannel;

c) applying through said separation media an electrophoretic current sufficient to cause said oligonucleotide fragments to migrate through said separation media;

wherein an interaction between said separation media and said fragments retards the migration of said fragments, wherein smaller fragments are retarded to a greater degree than larger fragments;

d) detecting separated oligonucleotide fragments at a detection location in said microchannel removed from said injection end of said microchannel.

2. The method of claim 1, wherein said step of detecting separated compounds is effected by detection of laser induced fluorescence as fragments migrate past a detection window.

3. The method of claim 1, wherein said step of detecting separated compounds is effected by mass spectrometry.

4. The method of claim 1, wherein said step of filling at least one channel with a separation media is effected a gas pressure loading of said microchannel, said gas pressure not greater than 100 psi.

5. The method of claim 1, wherein said at least one microchannel is part of an array of microchannels, wherein steps a through d are effected in each microchannel in said array of microchannels.

6. The method of claim 5, wherein said array of microchannels is a capillary tube array.

7. The method of claim 5, wherein said array of microchannels is a plurality of microchannels defined by a separation substrate.

8. The method of claim 1, wherein steps b and c are repeated at least twice, wherein following each injection step, an electrophoretic current is applied for an interval such that each mixture of fragments is detectably separated from any other mixture of fragments when each mixture of fragments migrates past the detection location.

9. The method of claim 1, wherein the step of filling the microchannel includes treating an interior surface of said microchannel to inhibit electroosmosis.

10. The method of claim 9, wherein treating the microchannel to inhibit electroosmosis includes adding a dynamic coating to the separation media.

11. The method of claim 9, wherein treating the microchannel to inhibit electroosmosis includes coating the interior surface of the capillary with a static coating.

12. The method of claim 9, wherein treating the microchannel to inhibit electroomosis includes covalent modification of the interior surface of the microchannel.

13. The method of claim 1, wherein said separation media includes a denaturing agent.

14. The method of claim 1, wherein said separation media includes an intercalating agent.

15. The method of claim 1, wherein the lengths of said fragments is between 11-30 bases.

16. The method of claim 1, wherein said separation media is free of an entangled, sieving matrix.

17. The method of claim 1, wherein said separation media includes non-entangled polyvinylpyrrolidone added to a known separation media.